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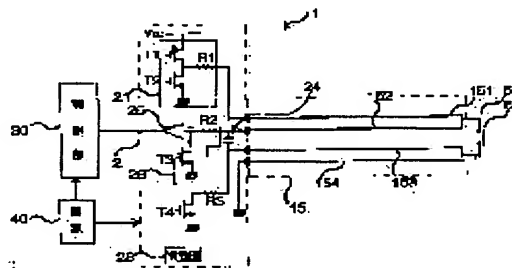
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## (54) ABNORMALITY MONITORING DEVICE

## (57)Abstract:

PROBLEM TO BE SOLVED: To provide a power-saving abnormality monitoring device which is securely capable of detecting a lot of abnormality.

SOLUTION: This device 1 comprises a detection part 2, a sensitive switch 5, and a connection part 15, the detection part 2 comprises a voltage generating part 21, a capacity element 24 of which both ends are connected through a second short-circuit line 152 and a third short-circuit line 153 to the sensitive switch 5, and a discharge switching circuit 26 connected between a first terminal of the capacity element 24 and a reference potential, and the connection part 15 comprises a first short-circuit line 151 of which starting end part is an output end of the voltage generating part 21, the second short-circuit line 152 of which starting end part is a last end part of the first short-circuit line 151, and of which last end part is the first terminal of the capacity element 24, the third short-circuit line 152 of which starting end part is a second terminal of the capacity element 24, and a fourth short-circuit line of which starting end part is a last end part of the third short-circuit line, and of which last end part is the reference potential in the



detection part 2. The connection part 15 may be a sensitive part passing a sealing seal.

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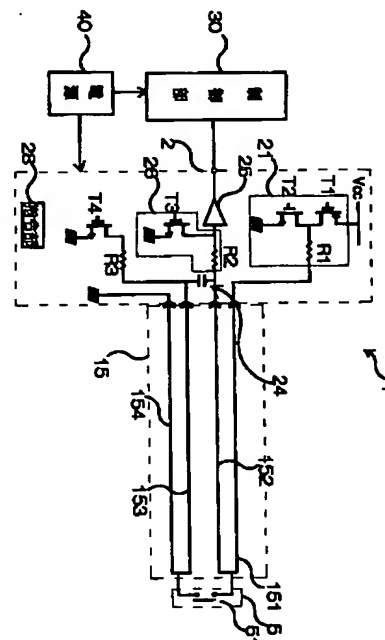
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(54)【発明の名称】 異常監視装置

(57)【要約】

【課題】 多くの異常を確実に検知出来る省電力の異常監視装置の提供。

【解決手段】 装置1は、検出部2と、感応スイッチ5と、連結部15とを有し、検出部2は、電圧発生部21と、その両端が第2短絡ライン152と第3短絡ライン153を介して感応スイッチ5に接続される容量素子24と、容量素子の第1端子と基準電位との間に接続される放電用スイッチング回路26とを有し、連結部15は、電圧発生部の出力端を始端部とする第1短絡ライン151と、第1短絡ラインの終端部を始端部とし容量素子の第1端子を終端部とする第2短絡ライン152と、容量素子の第2端子を始端部とする第3短絡ライン153と、第3短絡ラインの終端部を始端部とし検出部内の基準電位を終端部とする第4短絡ラインとを有する。連結部は封止シールを通る感応部としてもよい。



## 【特許請求の範囲】

【請求項1】 装置の異常を監視する異常監視装置であって、装置の異常に感応してオンオフする感応スイッチと、上記感応スイッチの作動状態を検出する検出部と、上記感応スイッチにおける常時開スイッチの出力端子と検出部との間を接続する連結部と、上記検出部を制御すると共に検出結果を受信し記録する制御部と、各部に所望の電力を供給する電源部とを有しており、上記検出部は、指令に応じて基準電位との間に所定の電圧を発生させる電圧発生部と、上記連結部を介してその両端が上記感応スイッチの常時開スイッチの出力端子に接続される容量素子と、上記容量素子の第1端子と基準電位との間に接続され指令に応じて開閉する放電用のスイッチング回路と、上記容量素子の上記第1端子の端子電圧に応動し二値信号 $S_n$ ,  $S_a$ を制御部に送信する中継素子と、上記電圧発生部及びスイッチング回路を制御する指令部とを有しており、上記連結部は、上記電圧発生部の出力端を始端部とし上記感応スイッチの常時開スイッチの出力端子の一方を終端部とする第1短絡ラインと、上記第1短絡ラインの終端部を始端部とし上記容量素子の第1端子を終端部とする第2短絡ラインと、上記容量素子の第2端子を始端部とし上記感応スイッチの常時開スイッチの出力端子の他方を終端部とする第3短絡ラインと、上記第3短絡ラインの終端部を始端部とし検出部に設けた基準電位を終端部とする第4短絡ラインとを有しており、上記指令部は、異常の有無を検知する測定モードでは上記電圧発生部の出力を有電圧状態にすると共に上記放電用のスイッチング回路を開路し、非測定モードでは、上記電圧発生部の出力をオフ状態にすると共に上記電荷放電用のスイッチング回路を閉路することを特徴とする異常監視装置。

【請求項2】 状態改変を防止する封止シールを貼付してなる装置の異常を監視する異常監視装置であって、装置の要部を封緘する単一または複数の封止シールと、上記封止シールそれぞれに延設され異常な外力に応動して回路を変化させる感応部と、上記感応部の回路の変化を検知する検出部と、上記検出部を制御すると共にその検出結果を受信し記録する制御部と、各部に所望の電力を供給する電源部とを有しており、上記感応部は、上記封止シールに狭小な間隙を介して電気的に絶縁して対置される第1、第2電極を形成すると共に各封止シールの第1電極間及び第2電極間を順次直列に接続して第1、第2電極連結路を形成し、検出部を始端部とし直列に接続された末端に位置する封止シールの第1の電極の末端を終端部とする第1短絡ラインと、上記第1短絡ラインの終端部を始端部とし、上記第1電極連結路を経て、直列接続の先端に位置する封止シールの第1電極の先端から検出部に至る接続導体を終端部とする第2短絡ラインと、検出部から直列接続の先端に位置する封止シールの第2電極の先端に至る接続導体を始端部とし上記第2電

極連結路を経て、直列接続の末端に位置する封止シールの第2電極の末端を終端部とする第3短絡ラインと、上記第3短絡ラインの終端部を始端部とし検出部に設けた基準電位を終端部とする第4短絡ラインとを有しており、上記検出部は、上記感応部の第1短絡ラインの始端部に接続され指令に応じて基準電位との間に所定の電圧を発生させる電圧発生部と、上記感応部の第2短絡ラインの終端部に第1端子を接続し第3短絡ラインの始端部に第2端子を接続する容量素子と、上記容量素子の第1端子と基準電位との間に接続され指令に応じて開閉する放電用のスイッチング回路と、上記容量素子の上記第1端子の端子電圧に応動し二値信号 $S_n$ ,  $S_a$ を制御部に送信する中継素子と、上記電圧発生部及びスイッチング回路を制御する指令部とを有しており、上記指令部は、異常の有無を検知する測定モードでは上記電圧発生部の出力を有電圧状態にすると共に上記放電用のスイッチング回路を開路し、非測定モードでは、上記電圧発生部の出力をオフ状態にすると共に上記放電用のスイッチング回路を閉路することを特徴とする異常監視装置。

【請求項3】 請求項2において、更に、装置には異常に感応してオンオフする感応スイッチが設けられており、上記感応スイッチの常時開スイッチの出力端子は、前記感応部の第1短絡ラインの終端部に第1端子が接続されると共に第3短絡ラインの終端部に第2端子が接続されていることを特徴とする異常監視装置。

【請求項4】 請求項1または請求項3において、上記感応スイッチは、装置のコネクタ部に配置されており、上記コネクタの挿脱に応動して動作することを特徴とする異常監視装置。

【請求項5】 請求項1から請求項4いずれか1項において、前記制御部は、検出部を介して前記感応部または感応スイッチの状態変化を検知した場合には、上記検出部に対し、短いインターバル $T_a$ において更に一回又は複数回の追加の測定指令を発し、上記複数の検出結果を総合的に判断し装置の正常、異常の判定を行うことを特徴とする異常監視装置。

【請求項6】 請求項1から請求項5のいずれか1項において、前記制御部は、実時間を表す時計装置または基準時からの経過時間をカウントするタイマーを有しており、検出部を介して装置の異常を検知した場合には、その時刻またはタイマーの計数値を記録することことを特徴とする異常監視装置。

【請求項7】 請求項2から請求項6のいずれか1項において、前記封止シールに対置された電極の対向部には、相対する電極の間隙が多くの方角の切断線にしても狭小となるよう、曲折する突部が形成されていることを特徴とする異常監視装置。

【発明の詳細な説明】

【0001】

【技術分野】 本発明は、異常を検知する感応スイッチや

物品を封緘する封止シールに異常が生じた場合に、それを自動的に検知する異常監視装置に関する。

【0002】

【従来技術】

【0003】一定の状態に保持すべき装置に異常が発生したことを検知するために、各種のセンサーが用いられている。また、物品の適当な場所に貼付する封止シールは、所定の状態に保持すべき物品に対して外部から変更が加えられたことを感知するものである。即ち、物品の保持状態に何らかの変更を加えようとする場合に、上記封止シールを剥離したり切断するなどの過程を経ること無しに装置の変更の作業が不可能となるようにする。そして、封止シールの状態を視認し剥離などの変化の有無を確認することにより、物品の状態に変更が加えられたか否かを確認する。このような封止シールを貼付して物品の状態を管理する物品としては、例えば、パチンコ等の遊技機械や、電気やガス等の取引用の計量器等がある。

【0004】例えば、最近のパチンコ機械等の遊技機械は、プログラムに基づいて所定の動作をするコンピュータ制御が採用されているが、プログラムを変更することにより出玉の状態を大幅に変化させることが可能となる。その為、外部からプログラムに変更が加えられるのを防止し或いは異常の発生を検知するために、例えばプログラムの格納部をカバー等で覆い、カバーに上記封止シールを貼付する。そして、プログラムの変更が上記カバーの取り外し即ち封止シールの剥離又は切断なしには不可能となるようにする。

【0005】即ち、例えば図12に示すように、パチンコ機械8の裏側には、マイクロコンピュータ等を搭載した制御基板82が取り付けられており、制御基板82にはプログラムを書き込んだメモリ83等が実装され、更に制御基板82はボックス85の内部に収容されている。そして、制御基板82とボックス85にかけて単一または複数の封止シール91が貼付されている。そのため、制御基板82のプログラムを変更したり、メモリ83を取り替えたりしようとする場合には、封止シール91を剥離したり、切断したりすることが必要となる。

【0006】その結果、封止シール91の状態に変化が無いかどうかを視認することにより、ボックス85が開かれて制御基板82に何らかの変更が加えられたかどうかを判断することができる。同様の目的を達成するために、異常な操作が装置に加えられた場合にオンオフ動作する感応スイッチを用いることもできる。そして、感応スイッチの動作を監視して装置の異常を検知する。

【0007】

【解決しようとする課題】しかしながら、封止シールを用いる方法には、次のような問題点がある。第1に、きわめて薄い鋭利な刃物等により巧妙に封止シール91を切断した場合には、それを人間の目で視認することは困

難であり、シールの状態変化の見落としが生易いという問題がある。また、目視する人の熟練度や精査時間の長短によりその異常検知精度も異なってくるから、その信頼度に問題がある。更に、シールの状態を一旦変化させた後にシールを修復し所謂復元処理を行った場合には、人間による異常の検知は一段と困難である。

【0008】第2に、仮に封止シール91に異常外力が印加されたことを検知したとしても、上記方法ではリアルタイムにそれを検知することができないから、異常の事後確認となり、状態変化がなされた時刻を知ることができないという問題がある。従って、対策が後手となり、また何時何処でそのような破壊がなされたか知ることができないから予防処置の立案が困難である。その為、例えば遊技機械の場合には、装置の変更が輸送の途中になされたのか店内に設置後になされたのか等が判断できず、従って今後の予防措置等を講ずることが困難となる。

【0009】一方、感応スイッチを装置に装着し、スイッチの動作を常時監視する方法は、監視装置を常時動作させるための電源が必要である。そして、装置を設置する場所に電源がある場合には、あまり問題とならないことが多い。しかしながら、装置の輸送中であるとか、離島など電源を取りにくい場所で異常を監視する場合には、その消費電力の大小が大きな問題になる。また、感応スイッチを用いる場合、感応スイッチの動作の検知だけではなく、監視装置と感応スイッチの間の配線に異常が生じた場合にも異常を検知することが要望されている。

【0010】本発明は、かかる従来の問題点に鑑みてなされたものであり、物品を封緘する封止シールに生じた各種の異常や異常検知用の感応スイッチの動作等を確実に検知することができると共に消費電力を少なく抑制することのできる異常監視装置を提供しようとするものである。

【0011】

【課題の解決手段】本願の第1発明は、装置の異常を監視する異常監視装置であって、装置の異常に感応してオンオフする感応スイッチと、上記感応スイッチの作動状態を検出する検出部と、上記感応スイッチにおける常時開スイッチの出力端子と検出部との間を接続する連結部と、上記検出部を制御すると共に検出結果を受信し記録する制御部と、各部に所望の電力を供給する電源部とを有しており、上記検出部は、指令に応じて基準電位との間に所定の電圧を発生させる電圧発生部と、上記連結部を介してその両端が上記感応スイッチの常時開スイッチの出力端子に接続される容量素子と、上記容量素子の第1端子と基準電位との間に接続され指令に応じて開閉する放電用のスイッチング回路と、上記容量素子の上記第1端子の端子電圧に依動し二値信号 $S_n$ 、 $S_a$ を制御部に送信する中継素子と、上記電圧発生部及びスイッチン

グ回路を制御する指令部とを有しており、上記連結部は、上記電圧発生部の出力端を始端部とし上記感応スイッチの常時開スイッチの出力端子の一方を終端部とする第1短絡ラインと、上記第1短絡ラインの終端部を始端部とし上記容量素子の第1端子を終端部とする第2短絡ラインと、上記容量素子の第2端子を始端部とし上記感応スイッチの常時開スイッチの出力端子の他方を終端部とする第3短絡ラインと、上記第3短絡ラインの終端部を始端部とし検出部に設けた基準電位を終端部とする第4短絡ラインとを有しており、上記指令部は、異常の有無を検知する測定モードでは上記電圧発生部の出力を有電圧状態にすると共に上記放電用のスイッチング回路を開路し、非測定モードでは、上記電圧発生部の出力をオフ状態にすると共に上記電荷放電用のスイッチング回路を閉路することを特徴とする異常監視装置にある。

【0012】本発明において特に注目すべきことの第1点は、感応スイッチの常時開スイッチの出力端子と検出部との間を連結部により接続し、連結部は、両者の間を2回往復する4つの短絡ラインからなることである。即ち、連結部は、検出部の電圧発生部の出力端を始端部とし上記感応スイッチの出力端子の一方を終端部とする第1短絡ラインと、上記第1短絡ラインの終端部を始端部とし検出部の容量素子の第1端子を終端部とする第2短絡ラインと、上記容量素子の第2端子を始端部とし感応スイッチの出力端子の他方を終端部とする第3短絡ラインと、上記第3短絡ラインの終端部を始端部とし検出部に設けた基準電位を終端部とする第4短絡ラインとを有する(図1の符号151~154参照)。

【0013】そして、第2短絡ラインの終端部と第3短絡ラインの始端部との間に容量素子が接続されているから、上記電圧発生部に電圧を発生させる測定モードでは、通常状態(スイッチ開)では容量素子が充電状態となり、基準電位と第1端子との間に端子電圧が発生する。一方、常時開スイッチが異常等に感応して閉路した場合には、上記容量素子の両端は、スイッチにより短絡され容量素子は充電されず、第1端子には端子電圧が発生しない。

【0014】また、他の異常モードとして、上記第1又は第2短絡ラインと第3又は第4短絡ラインとの間が何らかの要因により短絡した場合にも、同様に容量素子の第2端子には端子電圧が発生しない。上に述べた第1又は第2短絡ラインと第3又は第4短絡ラインとの間が短絡するような事態は、例えば、センサーとしての感応スイッチを検出部から切り離そうとして、鉄など導電性の刃物で連絡回路を切断する場合等に発生する。

【0015】更に、もう一つの異常モードとして、第1~第4短絡ラインが断線(開路)した場合にも、容量素子は充電されず、第2端子には端子電圧が発生しない。上に述べた第1~第4短絡ラインが断線(開路)するような事態は、例えば、感応スイッチを検出部から切り離

そうとして、セラミックなどの絶縁性の刃物で連絡回路を切断する場合等に発生する。

【0016】上記のように、測定モードにおいて正常時には容量素子に有電圧状態となるのに対して、異常時には容量素子は無電圧状態となる。また、容量素子の上記電圧状態は、中継素子により二値信号 $S_n$ 、 $S_a$ として制御部に送信される。そして、検知可能な異常のモードは、単に感応スイッチの動作だけではなく連結部の短絡や断路をも検知可能であり、多様な異常モードが検知可能である。続いて、測定モードから非測定モードに切り替えられると、上記電圧発生部の出力をオフ状態にし、上記電荷放電用のスイッチング回路を閉路する。その結果、容量素子に充電された電荷は、放電用のスイッチング回路を介して放電され、回路はリセット状態となる。

【0017】なお、上記測定モードの実行は、発生する異常現象の継続時間に対応して一定のインターバルにおいて実施すればよい。即ち、異常現象が少なくともAミリ秒は継続するものならば、Aミリ秒から検出時間と余裕時間とを差し引いた時間を基準にした間隔で測定モードを作動させれば充分である。測定頻度が多くなれば、それに比例して消費電力が増え、無駄な電力消費が増えるからである。

【0018】また、特に注目すべきことは、電圧を検知する素子は容量素子であるから、電源から流れこむ電流は測定モードに切り替えた場合に容量素子に一回だけ流れる充電電流であり、その結果消費電力は極めて少なくて済むことである。更に、検知可能な異常モードが複数であるにもかかわらず、一度だけの測定でよいから、一段と消費電力は少なくなる。上記のように、本発明によれば、各種の異常を確実に検知することができると共に消費電力を少なく抑制することのできる異常監視装置を提供することができる。

【0019】次に、本願の第2発明は、状態改変を防止する封止シールを貼付してなる装置の異常を監視する異常監視装置であって、装置の要部を封緘する単一または複数の封止シールと、上記封止シールそれぞれに延設され異常な外力に応動して回路を変化させる感応部と、上記感応部の回路の変化を検知する検出部と、上記検出部を制御すると共にその検出結果を受信し記録する制御部と、各部に所望の電力を供給する電源部とを有しており、上記感応部は、上記封止シールに狭小な間隙を介して電氣的に絶縁して対置される第1、第2電極を形成すると共に各封止シールの第1電極間及び第2電極間を順次直列に接続して第1、第2電極連絡路を形成し、検出部を始端部とし直列に接続された末端に位置する封止シールの第1の電極の末端を終端部とする第1短絡ラインと、上記第1短絡ラインの終端部を始端部とし、上記第1電極連絡路を経て、直列接続の先端に位置する封止シールの第1電極の先端から検出部に至る接続導体を終端部とする第2短絡ラインと、検出部から直列接続の先端

に位置する封止シールの第2電極の先端に至る接続導体を始端部とし、上記第2電極連結路を経て、直列接続の末端に位置する封止シールの第2電極の末端を終端部とする第3短絡ラインと、上記第3短絡ラインの終端部を始端部とし検出部に設けた基準電位を終端部とする第4短絡ラインとを有しており、上記検出部は、上記感応部の第1短絡ラインの始端部に接続され指令に応じて基準電位との間に所定の電圧を発生させる電圧発生部と、上記感応部の第2短絡ラインの終端部に第1端子を接続し第3短絡ラインの始端部に第2端子を接続する容量素子と、上記容量素子の第1端子と基準電位との間に接続され指令に応じて開閉する放電用のスイッチング回路と、上記容量素子の上記第1端子の端子電圧に応動し二値信号 $S_n$ 、 $S_a$ を制御部に送信する中継素子と、上記電圧発生部及びスイッチング回路を制御する指令部とを有しており、上記指令部は、異常の有無を検知する測定モードでは上記電圧発生部の出力を有電圧状態にすると共に上記放電用のスイッチング回路を開路し、非測定モードでは、上記電圧発生部の出力をオフ状態にすると共に上記放電用のスイッチング回路を閉路することを特徴とする異常監視装置にある。

【0020】本発明の回路的な構成は、第1発明において感応スイッチを設けず連結部に換えて感応部を設けたものである。しかしながら、上記感応部は、回路的には第1発明の連結部と同様であり、その第2、第3短絡ラインの一部を封止シールに形成した電極により構成したものである(図6参照)。そして、封止シールに形成した第2短絡ライン上の第1電極と第3短絡ライン上の第2電極とは、狭小な間隙を介して電氣的に絶縁して対置されており、上記のように両電極の間隙を狭小とすることにより、感応部は異常な外力に応動して容易に回路を変化させやすくなる。

【0021】即ち、封止シールを切断したり剥離したりしようとする場合、電極の一部が破断して電氣的に一体であった電極の連結体の回路が開路(断路)する(断路モード)。また、封止シールを破壊するのに、例えば金物などの導電性の刃物を用いて封止シールを切断した場合には、封止シールに形成した上記電極は狭小な間隙で対置されているから、その切断の途中において第1電極と第2電極の間が短絡され、結果として第2短絡ラインと第3短絡ラインとの間が短絡される(短絡モード)。

【0022】一方、例えばセラミック等の非導電性の刃物を用いて封止シールを切断しようとする場合には、少なくともその切断の途中において絶縁物が上記第1又は第2電極の直列回路を断路する(断路モード)。上記のように、封止シールに形成された感応部に異常な外力が加えられた場合には、本発明にかかる感応部では回路の構成の変化を容易に引き起こすように構成されている。

【0023】そして、第1発明と同様に、感応部におけ

る第1又は第2短絡ラインと第3又は第4短絡ラインとの間が何らかの要因により短絡した場合、並びに第1～第4短絡ラインが断線(開路)した場合には、容量素子の端子間は無電圧状態となる。即ち、正常時には容量素子の端子間が有電圧状態となるのに対して、感応部に上記の異常が生じた時には容量素子の端子間は無電圧状態に変化する。それ故、封止シールが破壊されたり剥離されたりする異常等を直ちに検出することができる。その他は、第1発明と同様であり、各種の異常を確実に検知することができると共に消費電力を少なく抑制することのできる異常監視装置を提供することができる。

【0024】なお、請求項7に記載のように、上記感応部における相対する電極の対向部には、相対する電極の間隙が多くの方角の切断線にしても狭小となるよう、曲折する突部が形成することが好ましい(実施形態例2の図6の突部115参照)。このように電極に突部を形成することにより、異常な外力が感応部に加えられた場合に、回路変化が確実に生じやすくなるからである。

【0025】そして、本願の第3発明は、第2発明において、更に、装置には異常に感応してオンオフする感応スイッチが設けられており、上記感応スイッチの常時開スイッチの出力端子は、前記感応部の第1短絡ラインの終端部に第1端子が接続されると共に第3短絡ラインの終端部に第2端子が接続されていることを特徴とする異常監視装置にある。

【0026】本発明は、第2発明において、第1発明と同様に第1短絡ラインの終端部と第3短絡ラインの終端部との間に感応スイッチの常時開スイッチを接続したものである。そして、回路的には第1発明と同様に動作し、感応スイッチによる装置異常が検知可能であると共に、感応スイッチと検出部との間に設けられている感応部における回路異常、即ち封止シールの異常等を同時に検知可能としたものである。その他については、第1、第2発明と同様である。

【0027】なお、上記第1、第3発明の感応スイッチには、請求項4記載のように、装置のコネクタ部等に配置され、コネクタの挿脱(機械的な操作)に応動して動作するものがある。その結果、例えば装置を改変しようとしてコネクタを挿脱した場合には、必ず感応スイッチが動作する。従って、回路がオープンしないように、ジャンパー線等によりコネクタの両側を短絡してコネクタを引き抜いたとしても、コネクタの操作を検知することができる(回路変化なき異常の検知)。

【0028】なお、請求項5に記載のように、検出部を介して前記感応部または感応スイッチの状態変化を検知した場合には、制御部は、上記検出部に対し、短いインターバル $T_a$ において更に一回又は複数回の追加の測定指令を発し、上記複数の検出結果を総合的に判断し装置の正常、異常の判定を行うことが好ましい。一度だけの検出では、ノイズ等により誤って異常信号 $S_a$ が発せら



れることがありうる。従って、異常信号Saが発せられた場合に、短いインターバルをおいて複数回のサーチを行い、複数の検出結果を総合的に判断することにより、誤った判定を回避することが可能となるからである。

【0029】また、そして、請求項6に記載のように、制御部に実時間を表す時計装置または基準時からの経過時間をカウントするタイマーを設け、短絡検知モード又は断路検知モードの場合に異常信号Saが発せられ装置の異常と判定した場合には、その時刻またはタイマーの計数値を記録することことが好ましい。

【0030】なお、タイマーを用いる場合には、タイマーの設定は、例えば工場の出荷などその後の異常発生の時期を把握するのが容易な時刻をその基準時刻に設定する。これにより、異常の発生、即ち装置に対する変更の操作がどの時点でなされたか、例えば輸送の途中になされたのか店内に設置後になされたのか等の判断が容易となる。

【0031】なお、監視装置の電源部は、電池を内蔵し、外部電源が無い場合においても一定期間各部に所望の電力をまかなうことができるようにすることが好ましい。上記電池は一次電池でも二次電池でもよい。これによって、例えば装置の輸送中や倉庫での保管中など電源を外部から取ることのできない状態において発生した装置の変更や異常も確実に把握することができるからである。そして、前記の低消費電力の特性により、その電池の寿命は大幅に長くすることが可能となる。

#### 【0032】

##### 【発明の実施の形態】実施形態例1

本例は、装置の異常を監視する異常監視装置であって、図1、図2に示すように、パチンコ機械(図12)などの装置の異常に感応してオンオフする複数の感応スイッチ5と、上記感応スイッチ5の作動状態を検出する検出部2と、感応スイッチ5における常時開スイッチ51の出力端子と検出部2との間を接続する連結部15と、上記検出部2を制御すると共に検出結果を受信し記録する制御部30と、各部に所望の電力を供給する電源部40とを有する異常監視装置1である。

【0033】そして、検出部2は、指令に応じて基準電位(グランド)との間に所定の電圧を発生させる電圧発生部21と、上記連結部15を介してその両端が感応スイッチ5の常時開スイッチ51の出力端子に接続される容量素子24と、容量素子24の第1端子と基準電位との間に接続され指令に応じて開閉する放電用のスイッチング回路26と、容量素子24の上記第1端子の端子電圧に感応し二値信号Sn、Saを制御部に送信する中継素子25と、電圧発生部21及びスイッチング回路26を制御する指令部28とを有している。

【0034】また、連結部15は、電圧発生部21の出力端を始端部とし感応スイッチ5の常時開スイッチ51

の出力端子の一方を終端部とする第1短絡ライン151と、第1短絡ライン151の終端部を始端部とし容量素子24の第1端子を終端部とする第2短絡ライン152と、容量素子24の第2端子を始端部とし感応スイッチ5の常時開スイッチ51の出力端子の他方を終端部とする第3短絡ライン153と、第3短絡ライン153の終端部を始端部とし検出部2内に設けた基準電位を終端部とする第4短絡ライン154とを有する。

【0035】そして、指令部28は、異常の有無を検知する測定モードでは電圧発生部21の出力を有電圧状態にすると共に放電用のスイッチング回路26を開路し、非測定モードでは、電圧発生部21の出力をオフ状態にすると共に電荷放電用のスイッチング回路26を閉路する。

【0036】そして、上記感応スイッチ5の一部は、装置の各所に配置された回路間を接続するコネクタ部に配置されており、上記コネクタの挿脱に感応して動作する(コネクタ部は、例えば、図6、図8の符号298、299参照)。また、制御部30は、検出部2を介して感応スイッチ5の状態変化を検知した場合には、図4に示すように、検出部2に対し、通常の測定インターバルTnよりも短いインターバルTaにおいて更にもう一回追加の測定指令を発し、上記複数の検出結果を総合的に判断し装置の正常、異常の判定を行う。また、制御部30は、図2に示すように、実時間を表す時計装置31を有しており、検出部2を介して装置の異常を検知した場合には、その時刻を記録する。

【0037】以下、それぞれについて説明を補足する。本例は、異常検知用のセンサーとして感応スイッチを設けた装置の異常を検知する異常監視装置1である。検出部2の電圧発生部21は、図1に示すように、スイッチング動作するトランジスタT1、T2を有しており、図3に示すように、トランジスタT1、T2のいずれか一方が、オン(導通)動作する。即ち、非測定モードにおいては、トランジスタT1がオフ状態にトランジスタT2がオン状態にあり、出力端子と基準電位(グランド)との間に電位差を生じない。そして、測定モードでは、トランジスタT1がオフ状態、トランジスタT2がオン状態となり、出力端子に電圧Voを発生する。

【0038】また、放電用のスイッチング回路26は、スイッチングトランジスタT3と電圧発生部の出力抵抗R1よりも相対的に小さい抵抗R2からなる( $R2 \leq R1$ )。そして、図3に示すように、非測定モードにおいては、容量素子24の電荷を放電させるためトランジスタT3がオン(導通)状態にあり、測定モードでは、トランジスタT3がオフ状態にあり、容量素子24に電荷チャージ可能とする。また、容量素子24の基準電位(グランド)側はスイッチング動作するトランジスタT4を介して接地されている。これは、第3、第4短絡ライン153、154が断線した場合にも容量素子24の



端子を基準電位（グランド）に保持しておくためである。

【0039】そして、監視装置1が、図3に示す測定モードに入ると、図2に示す通常（正常）状態にある場合には、容量素子24はその容量Cと抵抗R1で決まる時定数 $t_d$ で充電され、その両端に電圧 $V_o$ を発生させる。そして、中継素子25は、測定モードスタートから時定数 $t_d$ 経過後の適当な読み出しのタイミング $t_r$ に動作し、正常を示す二値信号 $S_n$ を送信する。

【0040】しかしながら、複数の感応スイッチ5のいずれかのスイッチ51が何らかの異常により閉路した場合には、容量素子24の両端は短絡され、容量素子24の両端に電圧は生じない。また、第1又は第2短絡ライン151、152と第3又は第4短絡ライン153、154との間が何らかの要因により短絡した場合にも、同様に容量素子24のグランドと第2端子の間には端子電圧が発生しない。（第1の異常モード）。

【0041】また、第1～第4短絡ライン151～154がラインの切断など何らかの異常により断線した場合には、同様に容量素子24に電圧は生じない（第2の異常モード）。そして、中継素子25は、測定モードスタートから時定数 $t_d$ 経過後の適当な読み出しのタイミング $t_r$ に動作し、異常を示す二値信号 $S_a$ を送信する。なお、この信号読み出しの場合において、上記第2の異常モードのうち第3、第4短絡ラインが断線した場合には、容量素子24のグランド側の電位が浮動することのないように、前記のようにトランジスタT4を読み出し前に動作させ、容量素子24の端子を確実に基準電位（グランド）に保持するようにする。

【0042】次に、上記測定サイクルが完了する時点で、指令部28からリセット信号が発せられ、検出部2は、非測定モードに入る。すると、図3に示すように、電圧発生部21のトランジスタT1、T2の動作は反転し、電圧発生部21の出力電圧はゼロになる。そして、放電用のスイッチング回路26のスイッチングトランジスタT3がオン動作し、低抵抗R2（ $R_2 \leq R_1$ ）による短い時定数で容量素子24の電荷は放電され、短時間で再度測定可能な状態に容量素子24は復元する。

【0043】そして、異常を検知した場合には、制御部30は、図4に示すように、検出部2に対し、短いインターバル $T_a$ において更に一回の追加の測定指令を発し、複数の検出結果を総合的に判断し装置の正常、異常の判定を行う。それ故、仮に一度だけの検出結果では、ノイズ等により誤って異常信号 $S_a$ が発せられることがありうるが、複数の検出結果を総合的に判断することにより、誤った判定を回避することが可能となる。

【0044】なお、上に述べた第1又は第2短絡ライン151、152と第3又は第4短絡ライン153、154との間が短絡するような事態は、例えば、センサーとしての感応スイッチ5を検出部2から切り離そうとし

て、鉄など導電性の刃物で連絡回路15を切断する場合等に発生する。また、上に述べた第1～第4短絡ライン151～154が断線（開路）するような事態は、例えば、感応スイッチ5を検出部2から切り離そうとして、セラミックなどの絶縁性の刃物で連絡回路を切断する場合等に発生する。

【0045】上記のように、本例が検知可能な異常のモードは、単に感応スイッチ5の動作だけではなく連絡部15における短絡や断路をも検知可能であり、多様な異常モードが検知可能である。そして、上記測定モードの実行は、発生が予想される異常現象の継続時間に対応して一定のインターバルをおいて実施する。即ち、異常現象が少なくともAミリ秒は継続するものならば、Aミリ秒から検出時間と余裕時間とを差し引いた時間を基準にした間隔で測定モードを実行する。測定頻度が多くなれば、それに比例して消費電力が増え、無駄な電力消費が増えるからである。

【0046】また、本装置1において電圧を検知する素子は容量素子24であるから、電源から流れこむ電流は測定モードに切り替えた場合に容量素子24に一度だけ流れる充電電流であり、その結果消費電力は極めて少なくて済む。更に、検知可能な異常モードが複数であるにもかかわらず、複数の異なった測定モードに切り替えることなく単一の測定モードの実行でよいから、このことによっても消費電力は少なくなる。また、本例の監視装置1の電源部40は、電池を内蔵しているから、外部電源が無い装置の輸送中や倉庫での保管中などの状態において発生した装置の改変や異常も確実に把握することができる。そして、前記の低消費電力の特性により、その電池の寿命を大幅に長びかせることができる。

【0047】また、制御部30は、図2に示すように、実時間を表す時計装置31を有しているから、検出部2を介して装置の異常を検知した場合には、その発生時刻をメモリ32に記録する。そして、通信インターフェース回路33を介して、適宜外部に送信する。同図において、符号36は検出部2とのインターフェース回路、符号35は各部31～33、36を制御するCPUである。。上記のように、本例によれば、各種の異常を確実に検知することができると共に消費電力を少なく抑制することのできる異常監視装置1を得ることができる。

#### 【0048】実施形態例2

本例は、状態改変を防止する封止シール81を貼付してなる装置の異常を監視する異常監視装置1である。監視装置1は、図6、図7に示すように、装置の要部を封緘する複数の封止シール81と、封止シール81それぞれに延設され異常な外力に応動して回路を変化させる感応部10と、感応部10の回路の変化を検知する検出部2と、検出部2を制御すると共にその検出結果を受信し記録する制御部30と、各部に所望の電力を供給する電源部40とを有する。

【0049】図5は、異常監視装置1と封止シールの配置態様の一例を示すものである。封止シール81はパチンコ機械等の制御基板82を覆うボックス85の主要部に複数貼付されている。そして、ボックス85内の制御基板82には、機械の動作態様を決めるプログラムメモリ83が搭載されている。そのため、メモリ83や制御基板82に何らかの手を加えようとする場合には、通常、封止シール81を破断するなど異常な外力が封止シール81に印加されることになる。

【0050】感応部10は、図6に示すように、封止シール81(810, 811)に狭小な間隙を介して電気的に絶縁して対置される第1、第2電極11, 12を形成すると共に各封止シール81(810, 811)の第1電極11間及び第2電極12間を順次直列に接続して第1、第2電極11, 12の連結路を形成する。

【0051】そして、感応部10は、検出部2を始端部とし直列に接続された末端に位置する封止シール810の第1の電極11の末端を終端部とする第1短絡ライン131と、第1短絡ライン131の終端部を始端部とし、上記第1電極11の連結路を経て、直列接続の先端に位置する封止シール811の第1電極11の先端から検出部に至る接続導体を終端部とする第2短絡ライン132と、検出部2から直列接続の先端に位置する封止シール811の第2電極12の先端に至る接続導体を始端部とし、上記第2電極12の連結路を経て、直列接続の末端に位置する封止シール810の第2電極12の末端を終端部とする第3短絡ライン133と、第3短絡ライン133の終端部を始端部とし検出部2内に設けた基準電位を終端部とする第4短絡ライン134とを有する。

【0052】検出部2は、感応部10の第1短絡ラインの始端部に接続され指令に応じて基準電位との間に所定の電圧を発生させる電圧発生部21と、感応部10の第2短絡ライン132の終端部に第1端子を接続し第3短絡ライン133の始端部に第2端子を接続する容量素子24と、容量素子24の第1端子と基準電位との間に接続され指令に応じて開閉する放電用のスイッチング回路26と、容量素子24の上記第1端子の端子電圧に応動し二値信号Sn, Saを制御部に送信する中継素子25と、電圧発生部21及びスイッチング回路26を制御する指令部28とを有している。図6において、符号298, 299は線間を接続するコネクタである。

【0053】指令部28は、異常の有無を検知する測定モードでは電圧発生部21の出力を有電圧状態にすると共に放電用のスイッチング回路26を開路し、非測定モードでは、電圧発生部21の出力をオフ状態にすると共に放電用のスイッチング回路26を閉路する。そして、電極11, 12の対向部には、相対する電極11, 12の間隙が多くの方角の切断線にしても狭小となるよう、曲折する波形の突部が形成されている。

【0054】本例の回路的な構成は、第1実施形態例に

おいて感応スイッチ5を設けず連結部15に換えて感応部10を設けたものである。しかしながら、感応部10は、回路的には連結部15と同様であり、その第2、第3短絡ライン132, 133の一部を封止シール81(810, 811)に形成した電極11, 12により構成したものである。そして、第2短絡ライン132上の第1電極11と第3短絡ライン133上の第2電極12とは、狭小な間隙を介して電気的に絶縁して対置されており、両者11, 12の間隙を狭小とすることにより、感応部10は異常な外力に応動して容易に回路を変化させることができるようになる。

【0055】即ち、図5に示す封止シール81(810, 811)を切断したり剥離した場合、例えば電極11又は12の一部が破断して電気的に一体であった電極11の連結体または電極12の連結体の回路が開路(断路)する(断路モード)。また、封止シール81(810, 811)を破壊するのに、例えば金物などの導電性の刃物を用いて封止シール81(810, 811)を切断した場合には、その切断の途中において、狭小な間隙で対置されている電極11, 12は第1電極11と第2電極12の間が短絡され、第2短絡ライン132と第3短絡ライン133との間が短絡される(短絡モード)。

【0056】一方、例えばセラミック等の非導電性の刃物を用いて封止シール81(810, 811)を切断しようとする場合には、少なくともその切断の途中において絶縁物が上記第1又は第2電極11, 12の直列回路を断路する(断路モード)。上記のように、封止シール81(810, 811)に異常な外力が加えられた場合には、感応部10では回路の構成の変化を容易に引き起こすように構成されている。

【0057】そして、第1実施形態例の場合と同様に、感応部10における第1又は第2短絡ライン131, 132と第3又は第4短絡ライン133, 134との間が何らかの要因により短絡した場合、並びに第1～第4短絡ライン131～134が断線(開路)した場合には、容量素子24の端子間は無電圧状態となる。即ち、正常時には容量素子24の端子間が有電圧状態となるのに対して、感応部10に上記のような異常が生じた時には容量素子24の端子間は無電圧状態に変化する。その他については実施形態例1と同様である。

【0058】実施形態例3

本例は、図8、図9に示すように、実施形態例2において、装置には更に異常に感応してオンオフする感応スイッチ5が設けられており、感応スイッチ5の常時開スイッチ51の出力端子は、感応部10の第1短絡ライン131の終端部にその第1端子が接続されると共に第3短絡ライン133の終端部にその第2端子が接続されている。

【0059】即ち、本例は、第2実施形態例において、第1実施形態例と同様に第1短絡ライン131の終端部

と第3短絡ライン133の終端部との間に感応スイッチ5の常時開スイッチ51を接続したものである。そして、回路的には第1実施形態例と同様に動作し、感応スイッチ51による装置異常が検知可能であると共に、感応スイッチ51と検出部2との間に設けられている感応部10における回路異常、即ち封止シール81(810, 811)の異常等を同時に検知可能とである。その他については、第1、第2実施形態例と同様である。

#### 【0060】実施形態例4

本例は、図10に示すように、実施形態例1に示した感応スイッチ5と連結部15と検出部2とからなる異常感知部を4個備え、実施形態例2に示した感応部10と検出部2とからなる異常感知部を1個備え、それらを1個の制御部3により制御するようにしたもう一つの実施形態例である。

【0061】即ち、本例の異常監視装置1の要部は、図10に示すように、4個の感応スイッチ5をそれぞれ連結部15と検出部2とを介して制御部3に接続すると共に、封止シール81(810, 811)を挿通する一個の感応部10を検出部2を介して制御部3に接続する。そして、制御部3は、5個の検出部2から送信される検出信号Sa又はSnを受信し記録する。

【0062】図11は装置1の外観構造の要部を示すものであり、上記制御部3と検出部2とを収容する回路部6に、4本の連結部15と1個の感応部10が接続されている。同図において、符号19は、外部との中継ケーブルであり、外部電源との接続線や通信線が収容されている。その他については実施形態例1～3と同様である。

#### 【0063】

【発明の効果】上記のように、本発明によれば、物品を封緘する封止シールに生じた各種の異常や異常検知用の感応スイッチの動作等を確実に検知することができると共に消費電力を極めて少なく抑制することのできる異常監視装置を得ることができる。

#### 【図面の簡単な説明】

【図1】実施形態例1の異常監視装置を検出部中心に図

示したシステム構成図。

【図2】実施形態例1の異常監視装置を制御部中心に図示したシステム構成図。

【図3】測定モードと非測定モードにおける主要素子の動作状態を示すタイムチャート(装置正常時)。

【図4】制御部から発せられる測定指令のインターバルTn, Taの態様を示す模式図。

【図5】実施形態例2の異常監視装置と封止シールの配置の一例を示す図。

【図6】実施形態例2の異常監視装置を検出部中心に図示したシステム構成図。

【図7】実施形態例2の異常監視装置を制御部中心に図示したシステム構成図。

【図8】実施形態例3の異常監視装置を検出部中心に図示したシステム構成図。

【図9】実施形態例3の異常監視装置を制御部中心に図示したシステム構成図。

【図10】実施形態例4の異常監視装置の要部のシステム構成図。

【図11】実施形態例4の異常監視装置の要部の外観構成図。

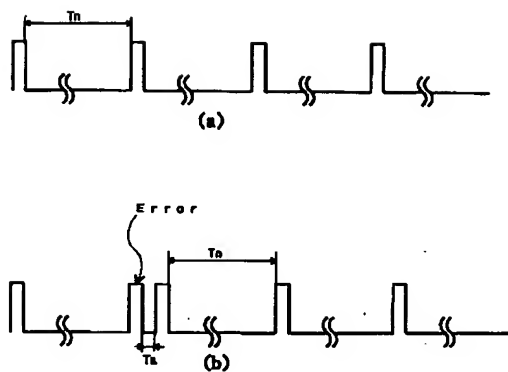
【図12】従来のパチンコ機械の制御部材及び封止シールの配置を示す図。

#### 【符号の説明】

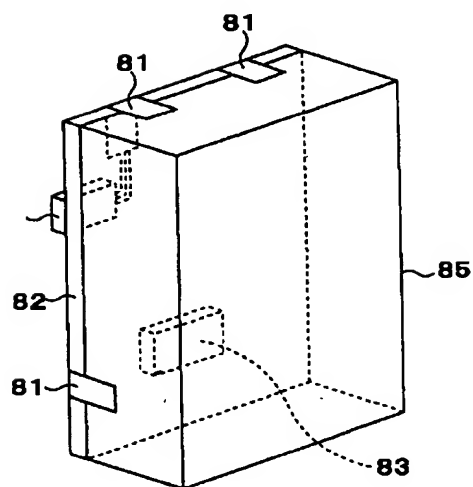
- 1... 異常監視装置、
- 15... 連結部、
- 151... 第1短絡ライン
- 152... 第2短絡ライン、
- 153... 第3短絡ライン、
- 154... 第4短絡ライン、
- 2... 検出部、
- 21... 電圧発生部、
- 24... 容量素子、
- 26... 放電用スイッチング回路、
- 5... 感応スイッチ、

Timing diagram for the measurement mode. The diagram shows the relationship between the measurement mode (測定モード) and the reset signal (リセット). The waveforms are labeled T1, T2, T3, T4, Cv, and 測定 (Measurement). The measurement mode is indicated by a double-headed arrow at the top. The reset signal is shown as a downward arrow at the end of the measurement mode. The measurement signal '測定' is a pulse that occurs during the measurement mode.

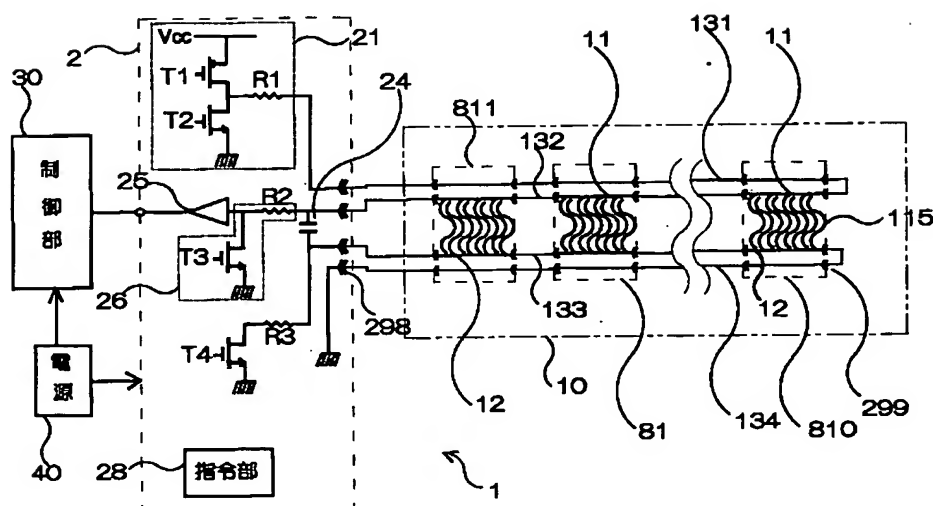
【図4】



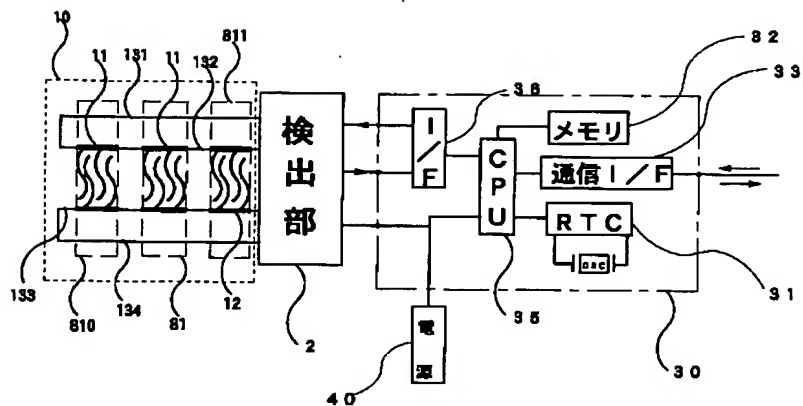
【図5】



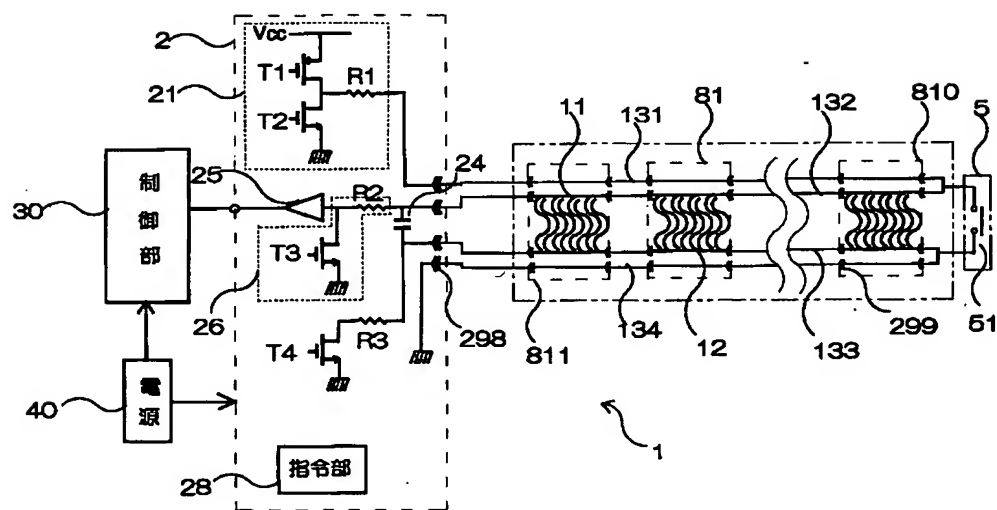
【図6】



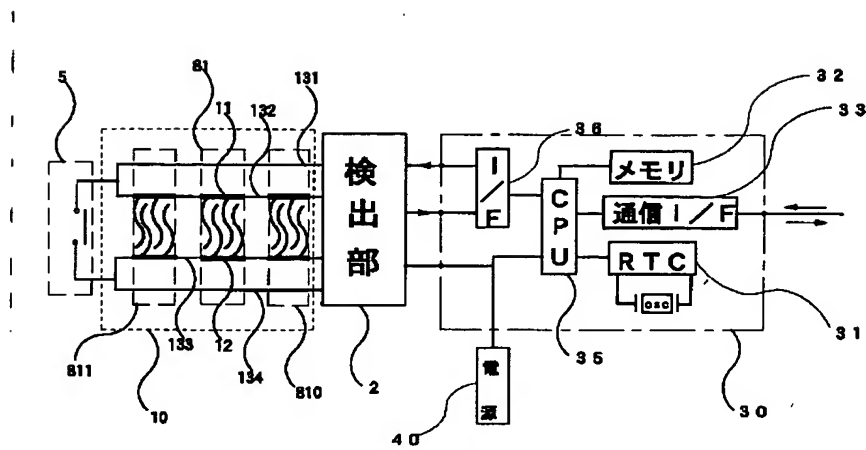
【図7】



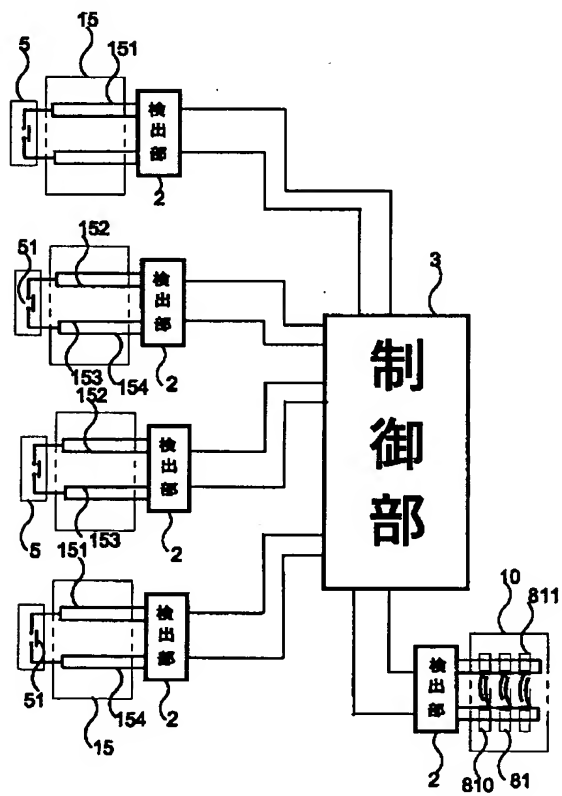
【図8】



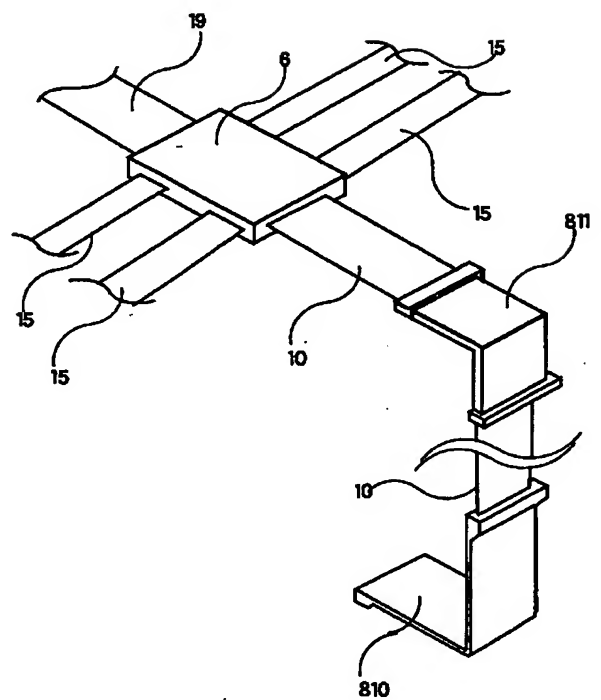
【図9】



【図10】

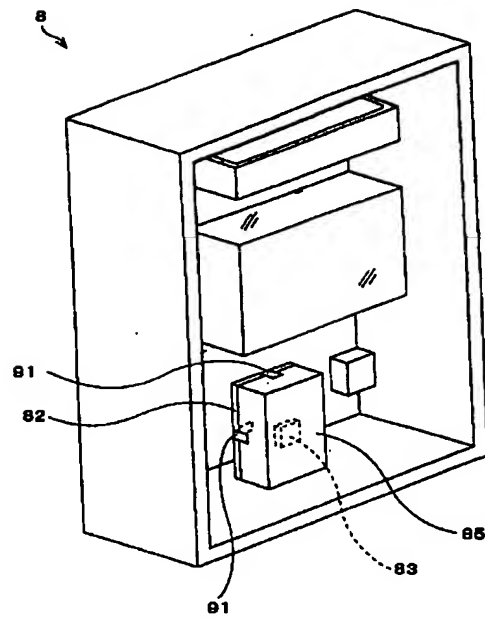


【図11】





【図12】



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フロントページの続き

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[JP,11-304865,A]

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CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE INVENTION TECHNICAL  
PROBLEM MEANS DESCRIPTION OF DRAWINGS DRAWINGS

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[Translation done.]

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 CLAIMS
 

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[Claim(s)]

[Claim 1] The induction switch which is emergency supervisory equipment which supervises the abnormalities of equipment, induces the abnormalities of equipment and is turned on and off, The connection section which connects between the detecting element which detects the operating state of the above-mentioned induction switch, and the output terminals of a normally open switch and detecting elements in the above-mentioned induction switch, It has the control section which receives and records a detection result while controlling the above-mentioned detecting element, and the power supply section which supplies desired power to each part. The above-mentioned detecting element The electrical-potential-difference generating section which generates a predetermined electrical potential difference between reference potentials according to a command, The capacitive element by which the ends are connected to the output terminal of the normally open switch of the above-mentioned induction switch through the above-mentioned connection section, The switching circuit for discharge which connects between the 1st terminal of the above-mentioned capacitive element, and a reference potential, and is opened and closed according to a command, The junction component which follows the terminal voltage of the 1st terminal of the above of the above-mentioned capacitive element, and transmits binary signals Sn and Sa to a control section, It has the command section which controls the above-mentioned electrical-potential-difference generating section and a switching circuit. The above-mentioned connection section The 1st short circuit line which makes a leader the outgoing end of the above-mentioned electrical-potential-difference generating section, and makes a trailer one side of the output terminal of the normally open switch of the above-mentioned induction switch, The 2nd short circuit line which makes a leader the trailer of the above-mentioned 1st short circuit line, and makes a trailer the 1st terminal of the above-mentioned capacitive element, The 3rd short circuit line which makes a leader the 2nd terminal of the above-mentioned capacitive element, and makes a trailer another side of the output terminal of the normally open switch of the above-mentioned induction switch, It has the 4th short circuit line which makes a trailer the reference potential which prepared the trailer of the above-mentioned 3rd short circuit line in necropsy appearance circles as the leader. The above-mentioned command section While changing the output of the above-mentioned electrical-potential-difference generating section into an owner electrical-potential-difference condition in the measurement mode which detects the existence of abnormalities, it carries out off [ of the switching circuit for the above-mentioned discharge ]. In the mode in which it does not measure Emergency supervisory equipment characterized by carrying out close [ of the switching circuit for the above-mentioned charge discharge ] while making the output of the above-mentioned electrical-potential-difference generating section into an OFF state.

[Claim 2] The single or two or more closure seals which are emergency supervisory equipment which supervises the abnormalities of equipment which come to stick the closure seal which prevents a condition alteration, and carry out the seal of the important section of equipment, The induction section to which it is installed by each above-mentioned closure seal, and a circuit is changed following unusual external force, The detecting element which detects change of the circuit of the above-mentioned induction section, and the control section which receives and records the detection result while controlling the above-mentioned detecting element, It has the power supply section which supplies desired power to each part. The above-mentioned induction section While forming the 1st and 2nd electrode which insulates electrically on the above-mentioned closure seal, and is counterposed through a narrow gap, connect inter-electrode [ of each closure seal / inter-electrode / 1st / and inter-electrode / 2nd ] to a serial one by one, and the 1st and 2nd electrode connection way is formed. The 1st short circuit line which makes a trailer the end of the 1st electrode of the closure seal located in the end which made the detecting element the leader and was connected to the serial, make the trailer of the above-mentioned 1st short circuit line into a leader, and pass the above-mentioned 1st electrode connection way -- the connection from the head

of the 1st electrode of the closure seal located at the head of a series connection to a detecting element -- with the 2nd short circuit line which makes a conductor a trailer the connection which results at the head of the 2nd electrode of the closure seal located at the head of a series connection from a detecting element -- make a conductor into a leader and pass the above-mentioned 2nd electrode connection way -- with the 3rd short circuit line which makes a trailer the end of the 2nd electrode of the closure seal located in the end of a series connection It has the 4th short circuit line which makes a trailer the reference potential which prepared the trailer of the above-mentioned 3rd short circuit line in necropsy appearance circles as the leader. The above-mentioned detecting element The electrical-potential-difference generating section which it connects [ section ] with the leader of the 1st short circuit line of the above-mentioned induction section, and generates a predetermined electrical potential difference between reference potentials according to a command, The capacitive element which connects the 1st terminal to the trailer of the 2nd short circuit line of the above-mentioned induction section, and connects the 2nd terminal to the leader of the 3rd short circuit line, The switching circuit for discharge which connects between the 1st terminal of the above-mentioned capacitive element, and a reference potential, and is opened and closed according to a command, The junction component which follows the terminal voltage of the 1st terminal of the above of the above-mentioned capacitive element, and transmits binary signals Sn and Sa to a control section, It has the command section which controls the above-mentioned electrical-potential-difference generating section and a switching circuit. The above-mentioned command section While changing the output of the above-mentioned electrical-potential-difference generating section into an owner electrical-potential-difference condition in the measurement mode which detects the existence of abnormalities, it carries out off [ of the switching circuit for the above-mentioned discharge ]. In the mode in which it does not measure Emergency supervisory equipment characterized by carrying out close [ of the switching circuit for the above-mentioned discharge ] while making the output of the above-mentioned electrical-potential-difference generating section into an OFF state.

[Claim 3] It is emergency supervisory equipment to which the induction switch which induces equipment unusually further and is turned on and off in claim 2 is formed, and the output terminal of the normally open switch of the above-mentioned induction switch is characterized by connecting the 2nd terminal to the trailer of the 3rd short circuit line while the 1st terminal is connected to the trailer of the 1st short circuit line of said induction section.

[Claim 4] It is emergency supervisory equipment characterized by arranging the above-mentioned induction switch in claim 1 or claim 3 at the connector area of equipment, and operating following insertion and detachment of the above-mentioned connector.

[Claim 5] It is emergency supervisory equipment characterized by setting the short interval Ta, emitting the measurement command of an addition of 1 more time or multiple times to the above-mentioned detecting element, judging synthetically two or more above-mentioned detection results, and performing the judgment of the normality of equipment, and abnormalities when said control section detects the change of state of said induction section or an induction switch through a detecting element in claim 4 any 1 term from claim 1.

[Claim 6] recording the enumerated data of the time of day or a timer, when said control section has the timer which counts the clock equipment showing the real time, or the elapsed time from a base period in any 1 term of claim 1 to claim 5 and the abnormalities of equipment are detected through a detecting element -- the emergency supervisory equipment characterized by things.

[Claim 7] Emergency supervisory equipment characterized by forming the projected part to bend in any 1 term of claim 2 to claim 6 so that it may become narrow, even if the gap of the electrode which faces the opposite section of the electrode counterposed by said closure seal makes it the cutting plane line of many directions.

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[Translation done.]

JAPANESE

[JP,11-304865,A]

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CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE INVENTION TECHNICAL  
PROBLEM MEANS DESCRIPTION OF DRAWINGS DRAWINGS

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[Translation done.]

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DETAILED DESCRIPTION

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## [Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the emergency supervisory equipment which detects it automatically, when abnormalities produce the induction switch which detects abnormalities, and an article on the closure seal which carries out a seal.

[0002]

## [Description of the Prior Art]

[0003] In order to detect that abnormalities occurred to the equipment which should be held in the fixed condition, various kinds of sensors are used. Moreover, the closure seal stuck on the suitable location of an article senses that modification was added from the exterior to the article which should be held in the predetermined condition. That is, it is made for the activity of modification of equipment to become impossible when it is going to add a certain modification to the maintenance condition of an article, without exfoliating the above-mentioned closure seal or passing through the process of cutting. And it is checked by checking the condition of a closure seal by looking and checking the existence of change, such as exfoliation, whether modification has been added to the condition of an article. As an article which sticks such a closure seal and manages the condition of an article, there is a measuring instrument for dealings of game machines, such as pachinko, the electrical and electric equipment, gas, etc., for example.

[0004] For example, although the computer control which carries out predetermined actuation based on a program is adopted, it becomes possible by changing a program to change the condition of reward balls of game machines, such as the latest pachinko machine, substantially. In order to prevent that modification is added to a program from the exterior for the reason or to detect generating of abnormalities, the above-mentioned closure seal is stuck for the storing section of a program on a bonnet and covering with covering etc. And it is made for modification of a program to become impossible without exfoliation or cutting of removal of the above-mentioned covering, i.e., a closure seal.

[0005] That is, as shown, for example in drawing 12, the control board 82 which carried the microcomputer etc. is attached in the background of the pachinko machine 8, the memory 83 grade which wrote in the program is mounted in a control board 82, and the control board 82 is further held in the interior of a box 85. And it applies to a control board 82 and a box 85, and a single or two or more closure seals 91 are stuck. Therefore, when the program of a control board 82 tends to be changed or it is going to exchange memory 83, it is necessary to exfoliate or to cut the closure seal 91.

[0006] Consequently, it can judge whether the box 85 was opened and a certain modification was added to the control board 82 by checking by looking whether there is any change in the condition of the closure seal 91. In order to attain the same object, when unusual actuation is added to equipment, the induction switch which carries out on-off control action can also be used. And actuation of an induction switch is supervised and the abnormalities of equipment are detected.

[0007]

[Problem(s) to be Solved] However, there are the following troubles in the approach using a closure seal. checking it by looking by human being's eyes, when a very thin sharp cutter etc. cuts the closure seal 91 skillfully to the 1st -- difficult -- an oversight of the change of state of a seal -- raw -- being easy -- \*\* -- there is a problem to say. Moreover, since the abnormality detection precision also changes with the level of skill of those who view, or merits and demerits of scrutinization time amount, a problem is in the reliability. Furthermore, when a seal is restored and the so-called restoration processing is performed once changing the condition of a seal, detection of the abnormalities by human being is more difficult.

[0008] there is a problem that the time of day when it became the follow up of abnormalities at and the change of state was made by it since real time could not be resembled by the above-mentioned approach and it could not be detected to it even if it detected that abnormality external force was impressed to the closure seal 91 to the 2nd cannot be known. Therefore, since it cannot know when and where the cure became a defensive hand and such destruction was made, planning of preventive treatment is difficult. For the reason, it becomes difficult to be unable to judge whether it was made as modification of equipment was transport, that it was made after installing in inside of a shop, etc. in the case of a game machine, therefore to lecture on a future precaution etc.

[0009] The power source for always operating supervisory equipment is required for the approach of equipping equipment with an induction switch and on the other hand, monitoring actuation of a switch continuously. And when a power source is in the location in which equipment is installed, it seldom becomes a problem in many cases. However, in supervising abnormalities in the location of equipment which is conveying or cannot take power sources, such as a detached island, easily, the size of the power consumption becomes a big problem. Moreover, it is requested that abnormalities are detected not only detection of actuation of an induction switch but when using an induction switch, and abnormalities arise in wiring between supervisory equipment and an induction switch.

[0010] This invention is made in view of this conventional trouble, and it tends to offer the emergency supervisory equipment which can control power consumption few while it can detect certainly various kinds of abnormalities produced on the closure seal which carries out the seal of the article, actuation of the induction switch for abnormality detection, etc.

[0011]

[Means for Solving the Problem] The induction switch which the 1st invention of this application is emergency supervisory equipment which supervises the abnormalities of equipment, and induces the abnormalities of equipment and is turned on and off, The connection section which connects between the detecting element which detects the operating state of the above-mentioned induction switch, and the output terminals of a normally open switch and detecting elements in the above-mentioned induction switch, It has the control section which receives and records a detection result while controlling the above-mentioned detecting element, and the power supply section which supplies desired power to each part. The above-mentioned detecting element The electrical-potential-difference generating section which generates a predetermined electrical potential difference between reference potentials according to a command, The capacitive element by which the ends are connected to the output terminal of the normally open switch of the above-mentioned induction switch through the above-mentioned connection section, The switching circuit for discharge which connects between the 1st terminal of the above-mentioned capacitive element, and a reference potential, and is opened and closed according to a command, The junction component which follows the terminal voltage of the 1st terminal of the above of the above-mentioned capacitive element, and transmits binary signals  $S_n$  and  $S_a$  to a control section, It has the command section which controls the above-mentioned electrical-potential-difference generating section and a switching circuit. The above-mentioned connection section The 1st short circuit line which makes a leader the outgoing end of the above-mentioned electrical-potential-difference generating section, and makes a trailer one side of the output terminal of the normally open switch of the above-mentioned induction switch, The 2nd short circuit line which makes a leader the trailer of the above-mentioned 1st short circuit line, and makes a trailer the 1st terminal of the above-mentioned capacitive element, The 3rd short circuit line which makes a leader the 2nd terminal of the above-mentioned capacitive element, and makes a trailer another side of the output terminal of the normally open switch of the above-mentioned induction switch, It has the 4th short circuit line which makes a trailer the reference potential which prepared the trailer of the above-mentioned 3rd short circuit line in necropsy appearance circles as the leader. The above-mentioned command section While changing the output of the above-mentioned electrical-potential-difference generating section into an owner electrical-potential-difference condition in the measurement mode which detects the existence of abnormalities, it carries out off [ of the switching circuit for the above-mentioned discharge ]. In the mode in which it does not measure While making the output of the above-mentioned electrical-potential-difference generating section into an OFF state, it is in the emergency supervisory equipment characterized by carrying out close [ of the switching circuit for the above-mentioned charge discharge ].

[0012] The 1st point of what should be observed especially in this invention connects between the output terminal of the normally open switch of an induction switch, and detecting elements by the connection section, and the connection section is consisting of four short circuit lines which go back and forth between both twice. Namely, the 1st short circuit line which the connection section makes a leader the outgoing end of the electrical-potential-difference generating section of a detecting element, and makes a trailer one side of the output terminal of the above-mentioned induction switch, The 2nd short circuit line which makes a leader the trailer of the above-mentioned 1st short circuit line, and makes a trailer the 1st



terminal of the capacitive element of a detecting element, It has the 3rd short circuit line which makes a leader the 2nd terminal of the above-mentioned capacitive element, and makes a trailer another side of the output terminal of an induction switch, and the 4th short circuit line which makes a trailer the reference potential which prepared the trailer of the above-mentioned 3rd short circuit line in necropsy appearance circles as the leader (151 to sign 154 reference of drawing 1).

[0013] And since the capacitive element is connected between the trailer of the 2nd short circuit line, and the leader of the 3rd short circuit line, in the measurement mode in which the above-mentioned electrical-potential-difference generating section is made to generate an electrical potential difference, in a normal state (switch open), a capacitive element will be in a charge condition and terminal voltage will occur between a reference potential and the 1st terminal. On the other hand, when a normally open switch responded and carries out close to abnormalities etc., the ends of the above-mentioned capacitive element are short-circuited with a switch, it does not charge and terminal voltage does not generate a capacitive element for the 1st terminal.

[0014] Moreover, as other abnormality modes, when between the above-mentioned 1st or 2nd short circuit line and the 3rd or 4th short circuit lines connects too hastily according to a certain factor, similarly for the 2nd terminal of a capacitive element terminal voltage does not occur. The situation which between the 1st or 2nd short circuit lines and the 3rd or 4th short circuit lines which were described above short-circuits is generated, when it is going to separate the induction switch as a sensor from a detecting element and conductive cutters, such as iron, cut a communication circuit.

[0015] Furthermore, as another abnormality mode, also when the 1st - the 4th short circuit line are disconnected (off), it does not charge and terminal voltage does not generate a capacitive element for the 2nd terminal. The situation (off) which the 1st described above - the 4th short circuit line disconnect is generated, when it is going to separate for example, an induction switch from a detecting element and insulating cutters, such as a ceramic, cut a communication circuit.

[0016] As mentioned above, at the time of abnormalities, a capacitive element will be in a non-electrical-potential-difference condition to a capacitive element being in an owner electrical-potential-difference condition in measurement mode always [ forward ]. Moreover, the above-mentioned electrical-potential-difference condition of a capacitive element is transmitted to a control section as binary signals Sn and Sa by the junction component. And the mode of detectable abnormalities can detect not only actuation of an induction switch but the short circuit and disconnection of the connection section, and can detect various abnormality modes. Then, if it changes from measurement mode to the mode in which it does not measure, the output of the above-mentioned electrical-potential-difference generating section will be made into an OFF state, and it will carry out close [ of the switching circuit for the above-mentioned charge discharge ]. Consequently, the charge charged by the capacitive element discharges through the switching circuit for discharge, and a circuit will be in a reset condition.

[0017] In addition, what is necessary is just to carry out activation in the above-mentioned measurement mode by setting a fixed interval corresponding to the duration time of the abnormality phenomenon to generate. That is, A ms at least has it, if an abnormality phenomenon operates measurement mode at spacing on the basis of the time amount which deducted detection time and a float from A ms when continuing. [ enough ] If measurement frequency increases, it will be from \*\* which gains in power consumption in proportion to it, and gains in useless power consumption.

[0018] Moreover, since the component as which especially the thing that should be observed detects an electrical potential difference is a capacitive element, the current which flows in from a power source is the charging current which flows only once to a capacitive element, when it changes to measurement mode, and, as a result, power consumption is it being very few and ending. Furthermore, only once, although detectable abnormality mode is plurality, since it is good, power consumption decreases much more in measurement. As mentioned above, according to this invention, while various kinds of abnormalities are certainly detectable, the emergency supervisory equipment which can control power consumption few can be offered.

[0019] Next, the single or two or more closure seals which the 2nd invention of this application is emergency supervisory equipment which supervises the abnormalities of equipment which come to stick the closure seal which prevents a condition alteration, and carry out the seal of the important section of equipment, The induction section to which it is installed by each above-mentioned closure seal, and a circuit is changed following unusual external force, The detecting element which detects change of the circuit of the above-mentioned induction section, and the control section which receives and records the detection result while controlling the above-mentioned detecting element, It has the power supply section which supplies desired power to each part. The above-mentioned induction section While forming the 1st and 2nd electrode which insulates electrically on the above-mentioned closure seal, and is counterposed through a narrow gap, connect inter-

electrode [ of each closure seal / inter-electrode / 1st / and inter-electrode / 2nd ] to a serial one by one, and the 1st and 2nd electrode connection way is formed. The 1st short circuit line which makes a trailer the end of the 1st electrode of the closure seal located in the end which made the detecting element the leader and was connected to the serial, make the trailer of the above-mentioned 1st short circuit line into a leader, and pass the above-mentioned 1st electrode connection way -- the connection from the head of the 1st electrode of the closure seal located at the head of a series connection to a detecting element -- with the 2nd short circuit line which makes a conductor a trailer the connection which results at the head of the 2nd electrode of the closure seal located at the head of a series connection from a detecting element -- make a conductor into a leader and pass the above-mentioned 2nd electrode connection way -- with the 3rd short circuit line which makes a trailer the end of the 2nd electrode of the closure seal located in the end of a series connection It has the 4th short circuit line which makes a trailer the reference potential which prepared the trailer of the above-mentioned 3rd short circuit line in necropsy appearance circles as the leader. The above-mentioned detecting element The electrical-potential-difference generating section which it connects [ section ] with the leader of the 1st short circuit line of the above-mentioned induction section, and generates a predetermined electrical potential difference between reference potentials according to a command, The capacitive element which connects the 1st terminal to the trailer of the 2nd short circuit line of the above-mentioned induction section, and connects the 2nd terminal to the leader of the 3rd short circuit line, The switching circuit for discharge which connects between the 1st terminal of the above-mentioned capacitive element, and a reference potential, and is opened and closed according to a command, The junction component which follows the terminal voltage of the 1st terminal of the above of the above-mentioned capacitive element, and transmits binary signals Sn and Sa to a control section, It has the command section which controls the above-mentioned electrical-potential-difference generating section and a switching circuit. The above-mentioned command section While changing the output of the above-mentioned electrical-potential-difference generating section into an owner electrical-potential-difference condition in the measurement mode which detects the existence of abnormalities, it carries out off [ of the switching circuit for the above-mentioned discharge ]. In the mode in which it does not measure While making the output of the above-mentioned electrical-potential-difference generating section into an OFF state, it is in the emergency supervisory equipment characterized by carrying out close [ of the switching circuit for the above-mentioned discharge ].

[0020] The circuit-configuration of this invention does not form an induction switch in the 1st invention, but is changed to the connection section and prepares the induction section. However, the electrode which that of the above-mentioned induction section is the same as that of the connection section of the 1st invention in circuit, and formed a part of the 2nd and 3rd short circuit line in the closure seal constitutes (refer to drawing 6 ). And through the gap where the 1st electrode on the 2nd short circuit line formed in the closure seal and the 2nd electrode on the 3rd short circuit line are narrow, it insulates electrically, and is counterposed, and the induction section becomes by making the gap of two electrodes narrow as mentioned above that it is easy to change a circuit easily following unusual external force.

[0021] That is, when a closure seal tends to be cut or it is going to exfoliate, some electrodes fracture and the circuit of the connection object of the electrode which was one electrically carries out off (disconnection) (disconnection mode). Moreover, when conductive cutters, such as hardware, are used although a closure seal is destroyed, and a closure seal is cut, since the above-mentioned electrode formed in the closure seal is counterposed in the narrow gap, between \*\* between the 1st electrode and the 2nd electrode short-circuits it in the middle of the cutting, and between the 2nd short circuit line and the 3rd short circuit lines short-circuits it as a result (short circuit mode).

[0022] On the other hand, when it is going to cut a closure seal using non-conductive cutters, such as a ceramic, an insulating material carries out the disconnection of the series circuit of the 1st or 2nd electrode of the above in the middle of the cutting at least (disconnection mode). As mentioned above, when unusual external force is applied to the induction section formed in the closure seal, it consists of the induction sections concerning this invention so that change of the configuration of a circuit may be caused easily.

[0023] And when between the 1st or 2nd short circuit lines and the 3rd or 4th short circuit lines in the induction section connects too hastily according to a certain factor and the 1st - the 4th short circuit line are disconnected in a list like the 1st invention (off), it will be in a non-electrical-potential-difference condition between the terminals of a capacitive element. That is, to between the terminals of a capacitive element being in an owner electrical-potential-difference condition always [ forward ], when the above-mentioned abnormalities arise in the induction section, it changes to a non-electrical-potential-difference condition between the terminals of a capacitive element. So, the abnormalities which a closure seal is destroyed or exfoliate are detectable promptly. While others are the same as that of the 1st invention and being able to detect various kinds of abnormalities certainly, the emergency supervisory equipment which can control power consumption

few can be offered.

[0024] In addition, even if the gap of the electrode which faces the opposite section [ in / like / the above-mentioned induction section ] of an electrode according to claim 7 which faces makes it the cutting plane line of many directions, it is desirable that the projected part to bend forms so that it may become narrow (projected part 115 reference of drawing 6 of the example 2 of an operation gestalt). Thus, when unusual external force is applied to the induction section by forming a projected part in an electrode, it is because it becomes easy to produce circuit change certainly.

[0025] And the induction switch which the 3rd invention of this application induces equipment unusually further in the 2nd invention, and is turned on and off is formed, and the output terminal of the normally open switch of the above-mentioned induction switch is in the emergency supervisory equipment characterized by connecting the 2nd terminal to the trailer of the 3rd short circuit line while the 1st terminal is connected to the trailer of the 1st short circuit line of said induction section.

[0026] This invention connects the normally open switch of an induction switch like the 1st invention in the 2nd invention between the trailer of the 1st short circuit line, and the trailer of the 3rd short circuit line. And while being able to operate like the 1st invention in circuit and being able to detect the abnormalities in equipment by the induction switch, detection of the abnormalities in a circuit in the induction section prepared between the induction switch and the detecting element, i.e., the abnormalities of a closure seal etc., is enabled simultaneously. About others, it is the same as that of the 1st and 2nd invention.

[0027] In addition, like, it is arranged at the connector area of equipment etc. and there is a thing according to claim 4 which operates following insertion and detachment (mechanical actuation) of a connector in the induction switch of the 1st and 3rd invention of the above. When it is going to change as a result, for example, equipment, and inserts [ connector ], an induction switch surely operates. Therefore, actuation of a connector is detectable, even if it short-circuits the both sides of a connector with a jumper etc. and draws out a connector so that a circuit may not open (detection of abnormalities without circuit change).

[0028] In addition, when [ according to claim 5 ] the change of state of said induction section or an induction switch is detected through a detecting element, it is [ like ] desirable [ a control section ] to set the short interval  $T_a$ , to emit the measurement command of an addition of 1 more time or multiple times, to judge synthetically two or more above-mentioned detection results, and to perform the judgment of the normality of equipment and abnormalities to the above-mentioned detecting element. In detection, the abnormality signal  $S_a$  may be only once emitted accidentally by the noise etc. Therefore, it is because it becomes possible to avoid the judgment which was mistaken by setting a short interval, searching multiple times and judging two or more detection results synthetically when the abnormality signal  $S_a$  is emitted.

[0029] moreover -- and the thing for which the enumerated data of the time of day or a timer are recorded when the timer which counts the clock equipment according to claim 6 which expresses the real time to a control section like or the elapsed time from a base period is formed, the abnormality signal  $S_a$  is emitted in the case of short circuit detection mode or disconnection detection mode and it judges with the abnormalities of equipment -- things are desirable.

[0030] In addition, in using a timer, setting out of a timer sets the time of day when it is easy to grasp the stage of subsequent abnormal occurrences, such as shipment of works, as the criteria time of day. Decision of whether by this, at which event was actuation of the alteration to generating of abnormalities, i.e., equipment, made, or it was made in the middle of transport, having been made after installing in inside of a shop becomes easy.

[0031] In addition, when a cell is built in and there is no external power, as for the power supply section of supervisory equipment, it is desirable to enable it to provide desired power to each part of a fixed period. A primary cell or a rechargeable battery is sufficient as the above-mentioned cell. It is because an alteration and abnormalities of the equipment generated by this in the condition that power sources, such as under transport of equipment and storage in a warehouse, cannot be taken from the outside can also be certainly grasped now. And the life of the cell becomes possible [ lengthening substantially ] with the property of the aforementioned low power.

[0032]

[Embodiment of the Invention] As the example of one example of an operation gestalt is emergency supervisory equipment which supervises the abnormalities of equipment and is shown in drawing 1 and drawing 2 Two or more induction switches 5 which induce the abnormalities of equipments, such as a pachinko machine ( drawing 12 ), and are turned on and off, The connection section 15 which connects between the detecting element 2 which detects the operating state of the above-mentioned induction switch 5, and the output terminals of the normally open switch 51 and detecting elements 2 in the induction switch 5, It is emergency supervisory equipment 1 which has the control section 30 which receives and records a detection result while controlling the above-mentioned detecting element 2, and the power supply section 40 which supplies

desired power to each part.

[0033] And the electrical-potential-difference generating section 21 which a detecting element 2 makes generate a predetermined electrical potential difference between reference potentials (gland) according to a command, The capacitive element 24 by which the ends are connected to the output terminal of the normally open switch 51 of the induction switch 5 through the above-mentioned connection section 15, The switching circuit 26 for discharge which connects between the 1st terminal of a capacitive element 24, and a reference potential, and is opened and closed according to a command, It has the junction component 25 which follows the terminal voltage of the 1st terminal of the above of a capacitive element 24, and transmits binary signals  $S_n$  and  $S_a$  to a control section, and the command section 28 which controls the electrical-potential-difference generating section 21 and a switching circuit 26.

[0034] Moreover, the 1st short circuit line 151 which the connection section 15 makes a leader the outgoing end of the electrical-potential-difference generating section 21, and makes a trailer one side of the output terminal of the normally open switch 51 of the induction switch 5, The 2nd short circuit line 152 which makes a leader the trailer of the 1st short circuit line 151, and makes the 1st terminal of a capacitive element 24 a trailer, It has the 3rd short circuit line 153 which makes the 2nd terminal of a capacitive element 24 a leader, and makes a trailer another side of the output terminal of the normally open switch 51 of the induction switch 5, and the 4th short circuit line 154 which makes a trailer the reference potential which made the leader the trailer of the 3rd short circuit line 153, and was prepared in the detecting element 2.

[0035] And in the measurement mode which detects the existence of abnormalities, the command section 28 carries out off [ of the switching circuit 26 for discharge ] while changing the output of the electrical-potential-difference generating section 21 into an owner electrical-potential-difference condition, and in the mode in which it does not measure, it carries out close [ of the switching circuit 26 for charge discharge ] while it makes an OFF state the output of the electrical-potential-difference generating section 21.

[0036] And some above-mentioned induction switches 5 are arranged at the connector area which connects between the circuits arranged at every place of equipment, and it operates following insertion and detachment of the above-mentioned connector (a connector area is sign 298,299 reference of [drawing 6](#) and [drawing 8](#) ). Moreover, when the change of state of the induction switch 5 is detected through a detecting element 2, as shown in [drawing 4](#) , to a detecting element 2, it sets the interval  $T_a$  shorter than the usual measurement interval  $T_n$ , and a control section 30 emits an additional measurement command further once again, judges synthetically two or more above-mentioned detection results, and performs the judgment of the normality of equipment, and abnormalities. Moreover, a control section 30 records the time of day, when it has clock equipment 31 showing the real time and the abnormalities of equipment are detected through a detecting element 2, as shown in [drawing 2](#) .

[0037] Hereafter, it supplements with explanation about each. This example is emergency supervisory equipment 1 which detects the abnormalities of equipment which formed the induction switch as a sensor for abnormality detection. As the electrical-potential-difference generating section 21 of a detecting element 2 is shown in [drawing 1](#) , it has the transistors T1 and T2 which carry out switching operation, and as shown in [drawing 3](#) , either of the transistors T1 and T2 carries out ON (flow) actuation. That is, in the mode in which it does not measure, a transistor T1 is in an OFF state, a transistor T2 is in an ON state, and the potential difference is not produced between an output terminal and a reference potential (gland). And in measurement mode, a transistor T1 will be in an OFF state, a transistor T2 will be in an ON state, and an electrical potential difference  $V_o$  is generated in an output terminal.

[0038] Moreover, the switching circuit 26 for discharge consists of small resistance  $R_2$  relatively rather than the output resistance  $R_1$  of switching transistor T3 and the electrical-potential-difference generating section ( $R_2 \leq R_1$ ). And as shown in [drawing 3](#) , in order to make the charge of a capacitive element 24 discharge in the mode in which it does not measure, transistor T3 is in an ON (flow) condition, and in measurement mode, transistor T3 is in an OFF state and enables charge charge at a capacitive element 24. Moreover, the reference potential (gland) side of a capacitive element 24 is grounded through transistor T four which carries out switching operation. This is for holding the terminal of a capacitive element 24 to the reference potential (gland), also when the 3rd and 4th short circuit line 153,154 is disconnected.

[0039] And when [ which is shown in [drawing 2](#) ] it is usually (normal) in a condition, it charges with the time constant  $\tau_d$  decided by the capacity  $C$  and resistance  $R_1$ , and a capacitive element 24 makes the ends generate an electrical potential difference  $V_o$ , if supervisory equipment 1 goes into the measurement mode shown in [drawing 3](#) . And the junction component 25 operates from a measurement mode start to the timing  $\tau_r$  of suitable read-out after time constant  $\tau_d$  progress, and transmits the binary signal  $S_n$  which shows normal.

[0040] However, when one switch 51 of two or more induction switches 5 carries out close by a certain abnormalities, the

ends of a capacitive element 24 are short-circuited and an electrical potential difference is not produced to the ends of a capacitive element 24. Moreover, when between the 1st or 2nd short circuit line 151,152 and the 3rd or 4th short circuit lines 153,154 connects too hastily according to a certain factor, similarly between the gland of a capacitive element 24, and the 2nd terminal terminal voltage does not occur. (1st abnormality mode) .

[0041] Moreover, when the 1st - the 4th short circuit lines 151-154 are disconnected by some abnormalities, such as cutting of a line, similarly an electrical potential difference is not produced in a capacitive element 24 (2nd abnormality mode).

And the junction component 25 operates from a measurement mode start to the timing  $t_r$  of suitable read-out after time constant  $t_d$  progress, and transmits the binary signal  $S_a$  which shows abnormalities. In addition, when the 3rd and 4th short circuit line is disconnected among the abnormality modes of the above 2nd in this signal read-out, read transistor T four as mentioned above, it is made to operate in front, and the terminal of a capacitive element 24 is certainly held to a reference potential (gland) so that the potential by the side of the gland of a capacitive element 24 may not float.

[0042] Next, when the above-mentioned measurement cycle is completed, a reset signal is emitted from the command section 28, and a detecting element 2 goes into the mode in which it does not measure. Then, as shown in drawing 3 , actuation of the transistors T1 and T2 of the electrical-potential-difference generating section 21 is reversed, and the output voltage of the electrical-potential-difference generating section 21 becomes zero. And switching transistor T3 of the switching circuit 26 for discharge carries out ON actuation, the charge of a capacitive element 24 discharges with the short time constant by the low resistance R2 ( $R2 \leq R1$ ), and a capacitive element 24 is again restored to a measurable condition for a short time.

[0043] And when abnormalities are detected, as shown in drawing 4 , to a detecting element 2, a control section 30 sets the short interval  $T_a$ , emits the measurement command of one more addition, judges two or more detection results synthetically, and performs the judgment of the normality of equipment, and abnormalities. So, [0044] which becomes possible [ avoiding the judgment which was mistaken by judging two or more detection results synthetically, although the abnormality signal  $S_a$  may be temporarily emitted accidentally by the noise etc. by the detection result only once ] In addition, the situation which between the 1st or 2nd short circuit lines 151,152 and the 3rd or 4th short circuit lines 153,154 which were described above short-circuits is generated, when it is going to separate the induction switch 5 as a sensor from a detecting element 2 and conductive cutters, such as iron, cut the communication circuit 15. Moreover, the situation (off) which the 1st described above - the 4th short circuit lines 151-154 disconnect is generated, when it is going to separate the induction switch 5 from a detecting element 2 and insulating cutters, such as a ceramic, cut a communication circuit.

[0045] As mentioned above, the mode of the abnormalities which can detect this example can detect not only actuation of the induction switch 5 but the short circuit and disconnection in the connection section 15, and can detect various abnormality modes. And corresponding to the duration time of the abnormality phenomenon in which generating is expected, activation in the above-mentioned measurement mode sets a fixed interval, and is carried out. That is, if an abnormality phenomenon continues A ms at least, measurement mode will be performed at spacing on the basis of the time amount which deducted detection time and a float from A ms. It is because power consumption will increase in proportion to it and useless power consumption will increase, if measurement frequency increases.

[0046] Moreover, since the component which detects an electrical potential difference in this equipment 1 is a capacitive element 24, the current which flows in from a power source is the charging current which flows only at once to a capacitive element 24, when it changes to measurement mode, and as a result, there is very little power consumption and it ends. Furthermore, although detectable abnormality mode is plurality, since it is good, power consumption decreases also by this in activation in single measurement mode, without changing to the measurement mode with which plurality differed. Moreover, since the power supply section 40 of the supervisory equipment 1 of this example builds in the cell, it can also grasp certainly an alteration and abnormalities of the equipment generated in the condition under transport of equipment without an external power, and storage in a warehouse etc. And the life of the cell can be substantially prolonged with the property of the aforementioned low power.

[0047] Moreover, since the control section 30 has clock equipment 31 showing the real time as shown in drawing 2 , when the abnormalities of equipment are detected through a detecting element 2, it records the generating time of day on memory 32. And it transmits outside suitably through the communication link interface circuitry 33. this drawing -- setting -- a sign 36 -- an interface circuitry with a detecting element 2, and a sign 35 -- each part 31- it is CPU which controls 33 and 36. . As mentioned above, according to this example, while various kinds of abnormalities are certainly detectable, the emergency supervisory equipment 1 which can control power consumption few can be obtained.

[0048] The example of two examples of an operation gestalt is emergency supervisory equipment 1 which supervises the

abnormalities of equipment which come to stick the closure seal 81 which prevents a condition alteration. two or more closure seals 81 with which supervisory equipment 1 carries out the seal of the important section of equipment as shown in drawing 6 and drawing 7 , and a closure seal 81 -- it has the induction section 10 to which is resembled, respectively, it is installed and a circuit changes following unusual external force, the detecting element 2 which detect change of the circuit of the induction section 10, the control section 30 which receive and record the detection result while controlling a detecting element 2, and the power supply section 40 which supply desired power to each part.

[0049] Drawing 5 shows an example of the arrangement mode of emergency supervisory equipment 1 and a closure seal. Two or more pastings of the closure seal 81 are carried out in the control boards 82, such as a pachinko machine, at the body of the wrap box 85. And the program memory 83 which determines the mode of a machine of operation is carried in the control board 82 in a box 85. Therefore, when it is going to add a certain hand to memory 83 or a control board 82, external force with usually unusual fracturing the closure seal 81 etc. will be impressed to the closure seal 81.

[0050] The induction section 10 connects between the 1st electrode 11 of each closure seal 81 (810,811), and between the 2nd electrode 12 to a serial one by one, and forms the connection way of the 1st and 2nd electrode 11 and 12 while it forms the 1st and 2nd electrode 11 and 12 which insulates electrically on the closure seal 81 (810,811), and is counterposed through a narrow gap, as shown in drawing 6 .

[0051] And the 1st short circuit line 131 which makes a trailer the end of the 1st electrode 11 of the closure seal 810 located in the end which the induction section 10 made the detecting element 2 the leader, and was connected to the serial, make the trailer of the 1st short circuit line 131 into a leader, and pass the connection way of the 1st electrode 11 of the above -- the connection from the head of the 1st electrode 11 of the closure seal 811 located at the head of a series connection to a detecting element -- with the 2nd short circuit line 132 which makes a conductor a trailer A conductor is made into a leader. the connection which results at the head of the 2nd electrode 12 of the closure seal 811 located at the head of a series connection from a detecting element 2 -- The 3rd short circuit line 133 which makes a trailer the end of the 2nd electrode 12 of the closure seal 810 located in the end of a series connection through the connection way of the 2nd electrode 12 of the above, It has the 4th short circuit line 134 which makes a trailer the reference potential which made the leader the trailer of the 3rd short circuit line 133, and was prepared in the detecting element 2.

[0052] The electrical-potential-difference generating section 21 which a detecting element 2 is connected [ section ] to the leader of the 1st short circuit line of the induction section 10, and generates a predetermined electrical potential difference between reference potentials according to a command, The capacitive element 24 which connects the 1st terminal to the trailer of the 2nd short circuit line 132 of the induction section 10, and connects the 2nd terminal to the leader of the 3rd short circuit line 133, The switching circuit 26 for discharge which connects between the 1st terminal of a capacitive element 24, and a reference potential, and is opened and closed according to a command, It has the junction component 25 which follows the terminal voltage of the 1st terminal of the above of a capacitive element 24, and transmits binary signals Sn and Sa to a control section, and the command section 28 which controls the electrical-potential-difference generating section 21 and a switching circuit 26. In drawing 6 , a sign 298,299 is a connector which connects between lines.

[0053] In the measurement mode which detects the existence of abnormalities, the command section 28 carries out off [ of the switching circuit 26 for discharge ] while changing the output of the electrical-potential-difference generating section 21 into an owner electrical-potential-difference condition, and in the mode in which it does not measure, it carries out close [ of the switching circuit 26 for discharge ] while it makes an OFF state the output of the electrical-potential-difference generating section 21. And even if the gap of the electrodes 11 and 12 which face makes it the cutting plane line of many directions, the wave-like projected part to bend is formed in the opposite section of electrodes 11 and 12 so that it may become narrow.

[0054] The circuit-configuration of this example does not form the induction switch 5 in the example of the 1st operation gestalt, but is changed to the connection section 15 and forms the induction section 10. However, the induction section 10 is the same as that of the connection section 15 in circuit, and the electrodes 11 and 12 which formed a part of the 2nd and 3rd short circuit line 132,133 in the closure seal 81 (810,811) constitute. And through the gap where the 1st electrode 11 on the 2nd short circuit line 132 and the 2nd electrode 12 on the 3rd short circuit line 133 are narrow, it can insulate electrically, and can be counterposed, and the induction section 10 can change a circuit now easily by making both 11 and 12 gap narrow following unusual external force.

[0055] That is, when the closure seal 81 (810,811) shown in drawing 5 is cut or it exfoliates, an electrode 11 or a part of 12 fractures, and the circuit of the connection object of the electrode 11 which was one electrically, or the connection object of an electrode 12 carries out off (disconnection) (disconnection mode). Moreover, when the closure seal 81 (810,811) is cut

using conductive cutters, such as hardware, between the 1st electrode 11 and the 2nd electrode 12 short-circuits the electrodes 11 and 12 currently counterposed in the middle of the cutting in the narrow gap, and between the 2nd short circuit line 132 and the 3rd short circuit lines 133 connects them with destroying the closure seal 81 (810,811) too hastily (short circuit mode).

[0056] On the other hand, when it is going to cut the closure seal 81 (810,811) using non-conductive cutters, such as a ceramic, an insulating material carries out the disconnection of the series circuit of the 1st or 2nd electrode 11 and 12 of the above in the middle of the cutting at least (disconnection mode). As mentioned above, when unusual external force is applied to the closure seal 81 (810,811), it consists of the induction sections 10 so that change of the configuration of a circuit may be caused easily.

[0057] And when between the 1st or 2nd short circuit lines 131,132 and the 3rd or 4th short circuit lines 133,134 in the induction section 10 connects too hastily according to a certain factor and the 1st - the 4th short circuit lines 131-134 are disconnected in a list as well as the case of the example of the 1st operation gestalt (off), it will be in a non-electrical-potential-difference condition between the terminals of a capacitive element 24. That is, to between the terminals of a capacitive element 24 being in an owner electrical-potential-difference condition always [ forward ], when the above abnormalities arise in the induction section 10, it changes to a non-electrical-potential-difference condition between the terminals of a capacitive element 24. About others, it is the same as that of the example 1 of an operation gestalt.

[0058] As the example of three examples of an operation gestalt is shown in drawing 8 and drawing 9, in the example 2 of an operation gestalt, the induction switch 5 which induces equipment still more unusually and is turned on and off is formed, and while the 1st terminal is connected to the trailer of the 1st short circuit line 131 of the induction section 10, as for the output terminal of the normally open switch 51 of the induction switch 5, the 2nd terminal is connected to the trailer of the 3rd short circuit line 133.

[0059] That is, this example connects the normally open switch 51 of the induction switch 5 like the example of the 1st operation gestalt in the example of the 2nd operation gestalt between the trailer of the 1st short circuit line 131, and the trailer of the 3rd short circuit line 133. And while being able to operate like the example of the 1st operation gestalt in circuit and being able to detect the abnormalities in equipment by the induction switch 51, it is that detection is possible in the abnormalities in a circuit in the induction section 10 prepared between the induction switch 51 and the detecting element 2, i.e., the abnormalities of the closure seal 81 (810,811) etc., simultaneously. About others, it is the same as that of the example of the 1st and 2nd operation gestalt.

[0060] The example of four examples of an operation gestalt is another example of an operation gestalt which is equipped with one abnormality sensor which consists of the induction sections 10 shown in the example 2 of an operation gestalt, and detecting elements 2, and controlled them by one control section 3 while being equipped with four abnormality sensors which consist of the induction switches 5 shown in the example 1 of an operation gestalt, the connection sections 15, and detecting elements 2, as shown in drawing 10.

[0061] That is, the important section of the emergency supervisory equipment 1 of this example connects to a control section 3 the induction section 10 of the piece which inserts in the closure seal 81 (810,811) through a detecting element 2 while connecting four induction switches 5 to a control section 3 through the connection section 15 and a detecting element 2, respectively, as shown in drawing 10. And a control section 3 receives and records the detecting signal Sa or Sn transmitted from five detecting elements 2.

[0062] the circuit section 6 which drawing 11 shows the important section of the appearance structure of equipment 1, and holds the above-mentioned control section 3 and a detecting element 2 -- the four connection sections 15 and the one induction section 10 -- connection -- now, it is. In this drawing, a sign 19 is a trunk cable with the exterior, and a path cord and a communication wire with an external power are held. About others, it is the same as that of the examples 1-3 of an operation gestalt.

[0063]

[Effect of the Invention] As mentioned above, according to this invention, while various kinds of abnormalities which produced the article on the closure seal which carries out a seal, actuation of the induction switch for abnormality detection, etc. are certainly detectable, the emergency supervisory equipment which can control power consumption very few can be obtained.

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[Translation done.]



JAPANESE

[JP,11-304865,A]

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CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE INVENTION TECHNICAL  
PROBLEM MEANS DESCRIPTION OF DRAWINGS DRAWINGS

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[Translation done.]

## \* NOTICES \*

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2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

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DESCRIPTION OF DRAWINGS

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## [Brief Description of the Drawings]

[Drawing 1] System configuration drawing which illustrated the emergency supervisory equipment of the example 1 of an operation gestalt focusing on the detecting element.

[Drawing 2] System configuration drawing which illustrated the emergency supervisory equipment of the example 1 of an operation gestalt focusing on the control section.

[Drawing 3] The timing diagram which shows the operating state of the main components in measurement mode and the mode in which it does not measure (always [ equipment forward ]).

[Drawing 4] The mimetic diagram showing the mode of the intervals  $T_n$  and  $T_a$  of the measurement command emitted from a control section.

[Drawing 5] Drawing showing an example of the emergency supervisory equipment of the example 2 of an operation gestalt, and arrangement of a closure seal.

[Drawing 6] System configuration drawing which illustrated the emergency supervisory equipment of the example 2 of an operation gestalt focusing on the detecting element.

[Drawing 7] System configuration drawing which illustrated the emergency supervisory equipment of the example 2 of an operation gestalt focusing on the control section.

[Drawing 8] System configuration drawing which illustrated the emergency supervisory equipment of the example 3 of an operation gestalt focusing on the detecting element.

[Drawing 9] System configuration drawing which illustrated the emergency supervisory equipment of the example 3 of an operation gestalt focusing on the control section.

[Drawing 10] System configuration drawing of the important section of the emergency supervisory equipment of the example 4 of an operation gestalt.

[Drawing 11] The appearance block diagram of the important section of the emergency supervisory equipment of the example 4 of an operation gestalt.

[Drawing 12] Drawing showing arrangement of the control-section material of the conventional pachinko machine, and a closure seal.

## [Description of Notations]

- 1 ... emergency supervisory equipment,
- 15 ... the connection section,
- 151 ... the 1st short circuit line
- 152 ... the 2nd short circuit line,
- 153 ... the 3rd short circuit line,
- 154 ... the 4th short circuit line,
- 2 ... a detecting element,
- 21 ... the electrical-potential-difference generating section,
- 24 ... a capacitative element,
- 26 ... the switching circuit for discharge,
- 5 ... an induction switch,

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[Translation done.]